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## Obstetric anal sphincter injuries

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### ABSTRACT

Obstetric anal sphincter injuries can be associated with significant short and long term consequences causing devastating impacts on the quality of lives of young, otherwise healthy women. The major consequence is anal incontinence which may be short or long term and vary in severity. The other consequences include pain, infection, dyspareunia and sexual dysfunction. This may in turn result in considerable economic burden to health care providers and patients. It also has an implication on future deliveries. Although it can never be eliminated, it can be reduced by improving practice, training and provision of high quality multidisciplinary care in order to reduce long-term morbidity. Obstetric anal sphincter injuries are also a source of litigation which can be distressing to both patients and clinicians. The aim of this review article is to explore the available evidence on epidemiology, strategies for preventions, prognosis and also how to deal with governance issues.

## 1. Introduction

Vaginal delivery is the major cause of anal dysfunction in women. Between 0.6% and 9.0% of women, who deliver vaginally, where mediolateral episiotomy is performed, sustain obstetric anal sphincter injuries (OASIS)<sup>[1]</sup>.

A recent study in the UK found four fold increases in the rate of reported third- or fourth-degree perineal tears in England, with the rate rising from 1.8% in 2000 to 5.9% in 2011<sup>[2]</sup>. An increased risk of OASIS was associated with a maternal age above 25 years, forceps and ventouse delivery, especially without episiotomy, Asian ethnicity, a more affluent socio-economic status, higher birth weight, and shoulder dystocia. One possible reason for this trend is the rise in maternal age at first birth and maternal weight, which are linked to a higher birth weight and risk of perineal tears. Other reasons include increased awareness and training, which is likely to result in a better case detection and recording of obstetric injuries, and changes in the management of the second stage of labour.

OASIS have short and long-term implication on womens' health. Recent studies have shown that between 20% and 40% of women who sustain OASIS has anal dysfunction<sup>[3–7]</sup>.

Workshop courses and supervised training over the last 10 years has led to an improvement in recognising and managing these tears. Ultrasound scanning detects residual defects in the anal sphincter complex in about 19%–36% of asymptomatic women following repair of OASIS. However, the clinical relevance of these asymptomatic defects currently remains unclear<sup>[4,8,9]</sup>.

Several factors have been implicated in OASIS either alone or in combination. One of the major risk factor is instrumental delivery. Hence, it is important that supervised training is provided during instrumental deliveries to minimise the incidence of these tears. Standardising the technique of episiotomy would also help to reduce risk of OASIS. Since it is difficult to eliminate OASIS it is important to provide multidisciplinary care and training to reduce the short and long-term morbidity from this condition. OASIS is also a source of litigation. Establishment of credible strategy in dealing with this clinical risk helps to improve patients' care and reduce litigation. In this review we aim to discuss the epidemiology, strategies for preventions, prognosis and also how to deal with governance issues.

## 2. Classification of perineal trauma

Prior to 1999, classifications of perineal trauma were inconsistent with lack of clarity of involvement of the specific components of the anal sphincter complex. Sultan revised this classification system, which has now been incorporated into the Royal College of Obstetricians and Gynaecology guidelines as well as the International Consultation on Incontinence (Table 1)<sup>[10]</sup>.

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Third and fourth degree tears that involve the obstetric anal sphincter complex are also known as ‘OASI’. A third degree perineal tear is defined as a partial or complete disruption of the anal sphincter muscles involving either or both external and internal anal sphincter muscles. Depending on the extent of involvement of the muscles the third degree tear is further sub classified into 3A, 3B and 3C.

A fourth degree tear is defined as a third degree tear that extended to involve anal mucosa. An isolated anal or rectal injury is rare and should be documented as separate entity. The main risk with such injury is the potential of ano or rectovaginal fistulae if not recognised and repaired at the time.

### 3. Epidemiology

Various risk factors are associated with OASIS. More often, these risk factors coexist and result in a compounding effect significantly increasing the risk of OASI. Some of these are modifiable and have a role in prevention of OASI. The main risk factor is forceps delivery with a risk of 7% followed by primiparity, shoulder dystocia and prolonged second stage (all 4%)<sup>[11]</sup>. The other risk factors include large birth weight, persistent occipito posterior position, induction of labour, epidural analgesia, episiotomy.

#### 3.1. Birth weight

A larger birth weight greater than 4 kg is a significant risk factor for OASI (2%)<sup>[12,13]</sup>. A recent metanalysis by Vasileios comparing the birth weights in second and first degree tears to OASI found that birth weight was consistently higher by 192.88 g (95% CI 139.80 g-245.96 g) in the OASI group<sup>[14]</sup>.

Larger birth weight results in a larger head circumference, prolonged labour, a higher risk of instrumental delivery and shoulder dystocia<sup>[15,16]</sup>. Also it is postulated to disrupt the supports of the pelvic floor as well as increase the risk for pudendal neuropathy which may cause functional bowel problems<sup>[17]</sup>.

#### 3.2. Episiotomy

Episiotomy is found to be a significant risk factor for causing severe perineal trauma. Though episiotomy is traditionally given to prevent perineal trauma in the second stage, the evidence for this is

still controversial. Systematic review by Eason *et al.* found that by avoiding episiotomy the incidence of perineal trauma decreased with an absolute risk difference of  $-0.23$  (95% CI  $-0.35, -0.11$ )<sup>[18]</sup>. However, the incidence varies with the type of episiotomy. Median episiotomy, which is more commonly performed in USA, has a much higher incidence of OASI compared to a mediolateral episiotomy that is favoured in European subcontinent.

There is some evidence that a mediolateral episiotomy may be beneficial in preventing OASIS, but its value is still debatable<sup>[19-23]</sup>. This could be due to the variations in practice of episiotomy itself. A wider angle may prevent an anal sphincter injury where as a narrow angle would predispose OASI<sup>[21,24]</sup>. Andrews *et al.* showed variations in performance of mediolateral episiotomies between doctors and midwives with none in the midwifery group performing the episiotomy in the desired angle between of 60°<sup>[25]</sup>. Jango *et al.*<sup>[26]</sup> found a protective effect from mediolateral episiotomies in primiparous women who are having a vacuum delivery. Latest systematic review by Vasileios has shown that median episiotomy was more associated with significant perineal trauma whereas this was not significant for mediolateral episiotomy<sup>[14]</sup>.

#### 3.3. Instrumental delivery

Instrumental delivery is associated with a higher incidence of OASI compared to normal delivery.

Vasileios *et al.*<sup>[14]</sup> found that the incidence is high regardless whether it was a forceps or a vacuum delivery. An earlier systematic review by Eason also found that the risk was increased with both instruments, but to a lesser extent by vacuum<sup>[18]</sup>. However, a population based study by Handa *et al.* found that ventouse delivery was associated with higher perineal trauma than forceps (OR 2.30; 95% CI 2.21, 2.40)<sup>[27]</sup>. There are several other studies quoting a higher incidence with forceps but the variations could be due to the larger practice of forceps deliveries in the studies compared to vacuum deliveries.

#### 3.4. Parity

The risk of sustaining an OASI is highest in the first delivery (4%)<sup>[15,23]</sup>. The odds ratio was found to be 3.24 (95% CI 2.2–4.76) in primigravida<sup>[14]</sup>.

#### 3.5. Asian ethnicity

Handa *et al.*<sup>[27]</sup> found that women of Indian and Filipino origin had a higher risk of sustaining severe perineal trauma. Groutz *et al.*<sup>[28]</sup> have also found the incidence in Asian women to be 20% compared to 3.2% in Caucasian women. Dua *et al.*<sup>[29]</sup> have demonstrated equal perineal length in Caucasian and Asian women in the first stage of labour; however they found shorter perineum as an independent risk factor. Perineal length was also not found to be a predictor for instrumental deliveries in this study. Hence it's possible that in this group it was the perineal length which was the independent factor rather than ethnicity, which increased the incidence of OASI.

#### 3.6. Other causes

Induced and augmented labour was found to be independent risk factors in causing OASIS. Though epidural analgesia

**Table 1**

Classification of perineal injury.

Type of tear	Definition
First degree tear	Injury to perineal skin
Second degree tear	Injury to perineum involving perineal muscles but not involving the anal sphincter
Third degree tear	Injury to the perineum involving the anal sphincter complex
3A	Less than 50% of EAS thickness torn
3B	More than 50% of EAS thickness torn
3C	Both EAS and IAS torn
Fourth degree tear	Injury to perineum involving the anal sphincter complex (both EAS & IAS) and anal epithelium
Buttonhole tear	External anal sphincter intact but anal or rectal mucosa with or without internal anal sphincter tear

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